

## **8. BEHAVIORAL AND/OR CULTURAL PRACTICES**

The effects of lifestyle, personal behavioral, and/or cultural practices could be a source of contaminant exposure or could increase one's exposure to toxic environmental contaminants. Exposure to these contaminants due to either behavioral (e.g., smoking, alcohol consumption, drug use) or cultural practices may result in adverse health effects. The sections below summarize studies that provide population estimates of persons engaging in certain behavioral and/or cultural practices that are known to increase the risk of exposure to environmental contaminants.

### **8.1. ACTIVITY PATTERNS**

This section presents population estimates on time activity patterns based on type of activity and presence in specific locations and microenvironments.

#### **8.1.1. National Human Activity Pattern Survey (NHAPS) (Tsang and Klepeis, 1996)**

The National Human Activity Pattern Survey (NHAPS) conducted by EPA, is the largest and most current human activity pattern survey available (Tsang and Klepeis, 1996). Data for 9,386 respondents in the 48 contiguous States were collected via minute-by-minute, 24-hour diaries between October 1992 and September 1994. The survey collected information on duration and frequency of selected activities. Demographic information was collected for each respondent to allow for statistical summaries to be generated according to specific subgroups of the U.S. population (e.g., by gender, age, race, employment status, census region, season). The participants' responses were weighted according to geographic, socioeconomic, time/season, and other demographic factors to ensure that results were representative of the U.S. population. The weighted sample matches the 1990 census population for each gender, age group, and census region. In addition, the day-of-week and seasonal responses are distributed equally.

NHAPS data on the time spent in selected activities and the corresponding population participating in these activities are presented in the *Exposure Factors Handbook*, Section 14, Tables 14-19 through 14-92. For example, data are included on the number of persons who spend time either running, walking, standing, or in a vehicle; time spent in indoor and outdoor

parking lots and garages; and number of persons working in circumstances where one may come in contact with soil, such as gardening. The reader is referred to the *Handbook* for further information obtained from NHAPS. Advantages of the NHAPS data set are that it is representative of the U.S. population for all ages, genders, and races, and it has been adjusted to be balanced geographically, seasonally, and for day/time.

### **8.1.2. Time Spent in Activities, Locations, and Microenvironments: A California- National Comparison (Robinson and Thomas, 1991)**

Robinson and Thomas (1991) reviewed data from the 1987-88 California Air Resources Board (CARB) time activity study and compared that data set with data collected by a similar 1985 national study, "Americans' Use of Time." The CARB study sampled residents of the State of California. One adult 18 years old or older was randomly sampled in each household. In the 1985 national study, single-day diaries were collected from more than 5,000 respondents across the United States, who were 12 years old and older. To facilitate comparisons, Robinson and Thomas (1991) recorded data from the national study to be as comparable as possible to the CARB study, and they restricted comparative analyses to the 18- to 64-year-old age group in the two studies. The authors compared 10 major activity categories and three major locations from both the CARB and the 1985 national study and defined a set of 16 microenvironments based on the activity and location codes employed in both studies.

Table 8-1 shows the percentage of "doers" (i.e., those engaged in the specific activity the day the diary was compiled) who participated in 10 various activities, were present at 10 various locations, and were present in 16 various microenvironments.

## **8.2. PICA STUDIES**

Pica is the ingestion of nonfood items (most commonly dirt) and can increase an individual's exposure to contaminants, especially if the material ingested is contaminated or has elevated levels of some elements (metals). Numerous articles have reported on the incidence of pica among various populations. However, most of these articles describe pica as the ingestion of substances other than soil, including sand, clay, paint, plaster, hair, string, cloth, glass, matches,

paper, feces, and various other items. These articles indicate that pica occurs in approximately one-half of all children between the ages of 1 and 3 years (Sayetta, 1986). The incidence of pica in children has been shown to differ for different populations, and the rate appears to be higher for black children than for white children. Danford (1982) reports that approximately 30% of black children aged 1 to 6 years are reported to have deliberate ingestion behavior, compared with 10 to 18% of white children in the same age group. Sex differences do not appear to influence the incidence rates (Kaplan and Sadock, 1985). Lourie et al. (1963) found a 50 to 60% pica rate among children in lower socioeconomic groups and a 30% pica rate among children from higher income families. Deliberate soil ingestion behavior appears to be more common in rural areas (Vermeer and Frate, 1979). A higher rate of pica also has been reported for pregnant women and individuals with poor nutritional status (Danford, 1982). In general, deliberate ingestion behavior is more frequent and more severe in mentally retarded children than in children in the general population (Behrman and Vaughan, 1983; Danford, 1982; Forfar and Arneil, 1984; Illingworth, 1983; Sayetta, 1986). Studies examining pica among populations are presented in this section.

#### **8.2.1. Reported Incidence of Pica Among Migrant Families (Bruhn and Pangborn, 1971)**

A review of literature indicates that pica has been observed among men, women, and children of all ages and races; however, reports show pica occurs most frequently among African Americans (Bruhn and Pangborn, 1971). Bruhn and Pangborn (1971) reported that pica was explained as a cultural trait of African Americans, and they cited other studies that found higher incidences of pica in pregnant African American women, compared with pregnant Caucasian women. The authors found that "pregnant women say they eat these substances [clay] because they simply crave them or because they will make the baby stronger, with a more suitable color, and without birthmarks" (Bruhn and Pangborn, 1971). To investigate the occurrence of pica in low-income families, the authors conducted food habit interviews in English and Spanish among 91 families in California from May through August 1969. The families were selected from three migrant labor camps operated by the Office of Economic Opportunity in Northern California, and they included (1) 65 migrant agricultural families of Mexican descent, born in Texas or Mexico, and (2) 26 families of "Anglo" heritage, born in Texas, Arkansas, or Oklahoma. The interviews

used questionnaires to ask the family spokesperson (usually the wife) to estimate the incidence of pica in these families. Table 8-2 presents results of the interviews. In the families of "Anglo" descent, 14 families (54%) observed pica in children, with 11 cases observed in their own or a relative's child. Table 8-2 also shows that 19 and 7% of the respondents reported pica in pregnant and nonpregnant women, respectively. The families of Mexican descent reported 32, 38, and 15% of pica incidences in children, pregnant women, and nonpregnant women, respectively. Pica in men was not reported by either group. The potential causes of pica were attributed to cultural, behavioral, and socioeconomic factors in the groups studied. The authors stated that apparently the urge for some women to eat clay and cornstarch represents a cultural practice passed down from generations and is an accepted behavior in their community (Bruhn and Pangborn, 1971).

### **8.2.2. Geophagia in Rural Mississippi: Environmental and Cultural Contexts and Nutritional Implications (Vermeer and Frate, 1979)**

Vermeer and Frate (1979) investigated the environmental and cultural factors surrounding geophagia (deliberate consumption of earth/soil) in the black population in a rural county of Mississippi. Geophagia, the practice of eating earth, also referred to as pica, is known to have occurred since prehistoric times in all ethnic, social, and economic groups and was reported to occur most frequently in the rural South in both black and white populations. Early historical records indicate that geophagia was transferred primarily from Africa via slave trade into the New World (Vermeer and Frate, 1979). The authors reported that the custom continued when blacks migrated to the urban North, where laundry starch became a substitute for the clays commonly consumed.

The study was conducted in Holmes County, Mississippi, which at the time had a predominantly (71%) black population composed of rural small communities (200-500 people) where the social life centered on the church. Of the households sampled, females headed 41%. The survey questionnaires on geophagia were in three parts: the nutrition study, the perinatal study, and the health utilization study. In the nutrition study, 500 black households were surveyed randomly, but geophagia questionnaires were administered to only 50 households (10%) of the sampled population. Of these 50 households, 229 individuals (56 women, 33 men, 115

children, and 25 adolescents) were surveyed. In the perinatal study, geophagia information was obtained from 142 pregnant women. The health utilization survey sampled 200 households, of which 20 were given the geophagia questionnaires. In all three studies, geophagia was defined as the consumption of clay on a regular basis over a period of weeks (Vermeer and Frate, 1979).

The nutrition study results presented in Table 8-3 show neither male adults nor adolescents practiced geophagia, but 57% of the women and 16% of the children (under 13 years) practiced geophagia (Vermeer and Frate, 1979). The perinatal study revealed that 28% of pregnant and postpartum women practiced geophagia. An additional 19% of respondents in this population group consumed other materials, mainly commercial products (e.g., laundry starch, dry powdered milk, and baking soda) (Vermeer and Frate, 1979).

### **8.3. SMOKING, DRUG USE, AND ALCOHOL CONSUMPTION**

This section presents summaries of studies on behavioral and social practices, such as smoking, drug use, and alcohol consumption, which could potentially increase an individual's exposure to environmental contaminants.

#### **8.3.1. Results From the National School-Based 1991 Youth Risk Behavior Survey and Progress Toward Achieving Related Health Objectives for the Nation (Kann et al., 1993)**

The Centers for Disease Control and Prevention (CDC) developed the Youth Risk Behavior Surveillance System (YRBSS) as an ongoing project to evaluate priority high health risk behaviors among adolescents nationwide. Kann et al. (1993) presented partial results from that 1991 survey, which employed a three-stage cluster sample design that consisted of students in public, parochial, and other private schools in grades 9 through 12, in all 50 States and the District of Columbia. The questionnaires administered to the students collected information on priority health risk behaviors related to unintentional and intentional injury, tobacco use, alcohol and other drug use, sexual behavior (i.e., unintended pregnancies and sexually transmitted diseases, including HIV infection), dietary behavior, and physical activity.

The survey sampled 13,568 students, of which data from 12,272 (90%) of the students were usable. Of the survey respondents, 14% were blacks, 9% were Hispanic, 70% were white, and 7% were from other ethnic groups. The data obtained from the survey were based on either a 30-day or 12-month recall. The percentages of white, black, and Hispanic youths who reported engaging in the specific high-risk behaviors during the survey period are presented in Table 8-4. A higher percentage of whites (15%) frequently smoked cigarettes, compared with Hispanics (7%) and blacks (3%). Table 8-4 also indicates that 54% of Hispanic, 53% of white, and 42% of black students consumed at least one drink of alcohol during the 30 days before the survey. Three percent of Hispanics, 2% of whites, and 1% of blacks used cocaine during the 30 days preceding the survey. Table 8-5 presents results in percentages of the dietary behavior and physical activity among the students grouped by gender, grade level, and race. A higher proportion of male students (15%) consumed five or more servings of fruits and vegetables than female students (10%).

### **8.3.2. Cigarette Smoking and Cessation Behaviors Among Urban Blacks and Whites (Hahn et al., 1990)**

Hahn et al. (1990) studied smoking behavior among blacks and whites in a population-based sample of 2,626 residents aged 35 to 74 years in the Minneapolis-St. Paul area. Surveys of the general population conducted in this area were of two parts: the first series was conducted from 1980 to 1982, and the second series was initiated in December 1985. The second series of surveys conducted used a two-stage sample design and updated census information. Individuals in a cluster sample of households in the seven-county area were randomly selected. Home interviews were conducted in which information on health behaviors, attitudes, and knowledge were collected. Following the home interviews, survey clinics were conducted in neighborhood churches in which questionnaires were completed. These questionnaires provided physiological measurements related to risk factors.

Results from the survey are presented in Tables 8-6 through 8-8 (Hahn et al., 1990). Ratios in these tables are the presented value out of 100 percent. Table 8-6 shows that more blacks (aged 35 to 74 years) were current smokers than whites in the same age group. Table 8-6

also shows that the ratio of former smokers to those who had ever smoked was greater for white men than for black men and greater for white women than for black women. Table 8-7 indicates that persons with educations beyond high school smoked less, regardless of their race or sex. Table 8-8 presents data on current smokers' smoking cessation behavior. Whites were more likely than blacks to attempt to quit smoking. Among men, whites were more likely than blacks to successfully quit smoking. More black men than white men planned to reduce the number of cigarettes smoked per day, and more white women than black women tried brands with low nicotine and tar. Hahn et al. (1990) concluded that important factors preventing smokers from quitting included the number of cigarettes smoked daily, lack of desire to cease smoking, and the physiological difficulty of quitting.

### **8.3.3. Sociodemographic Characteristics of Cigarette Smoking Initiation in the United States (Escobedo et al., 1990)**

Escobedo et al. (1990) estimated the age-specific incidence of cigarette smoking initiation by race/ethnicity, sex, and educational attainment by analyzing the smoking history data of young adults, aged 18 to 35 years, in the 1987 National Health Interview Survey (NHIS) and the 1982-1984 Hispanic Health and Nutrition Examination Survey (HHANES). Both NHIS and HHANES were based on personal interviews of households in the United States. Escobedo et al. (1990) noted that HHANES was not representative of the Hispanic population in the United States; however, the geographic areas surveyed included a substantial proportion of Hispanics. Data from 14,764 out of 44,123 individuals surveyed in NHIS and 3,123 out of 9,643 individuals surveyed in HHANES were employed in the analysis conducted by Escobedo et al. (1990).

The incidence of smoking initiation at a specific age was determined as being the number of individuals who had started smoking cigarettes at that age divided by the number of individuals who had not started smoking regularly before that age (Escobedo et al., 1990). The authors reported that from both surveys "ever smokers" were considered to be those respondents who answered yes to the question, "Have you smoked at least 100 cigarettes in your entire life?" Among all race/ethnic groups, smoking initiation occurred at ages as young as 9 years of age,

increased rapidly after 11 years of age, peaked at 17 to 19 years of age, and declined substantially after 19 years of age (Escobedo et al., 1990).

Escobedo et al. (1990) calculated age-specific smoking initiation rates by gender and educational attainment. Table 8-9 presents the smoking initiation rates (percent) by gender, age, and race/ethnicity. Of all men who started smoking at 18 years old or younger, Hispanic men had the highest smoking initiation rate, and black men had the lowest rate. Table 8-9 also shows that smoking initiation rates were similar among men who started smoking between the ages of 19 and 35 years, with black men showing the highest rate (22%). Among the females who started smoking at 18 years or younger, white and Puerto Rican American women had the highest initiation rate. Compared with men of both age groups, women had lower smoking initiation rates in all race/ethnic groups. Table 8-10 summarizes the smoking initiation rates by age, race/ethnicity, and educational attainment. A comparison of respondents with more than a high school education to those who had less than high school education showed that respondents with less than high school education had higher smoking initiation rates for all age groups and all races and ethnic groups. Table 8-10 also shows that among all race/ethnic groups, initiation rates were highest during adolescence (12 to 18 years old) and lowest during childhood (11 years old and younger).

#### **8.3.4. Statistical Abstract of the United States (U.S. Bureau of the Census, 1995)**

The U.S. Bureau of the Census provides summary statistics on social, political, and economic characteristics of the U.S. population. Table 8-11 presents data on persons who used certain drugs in 1993 grouped by age of user, gender, race/ethnicity, and region. Table 8-11 also shows the users in 1993 of cigarettes, alcohol, marijuana, cocaine, smokeless tobacco, crack cocaine, inhalants, hallucinogens, stimulants, sedatives, tranquilizers, and analgesics.

#### **8.3.5. Trends in Indian Health (U.S. Department of Health and Human Services, 1993)**



The U.S. Public Health Service, through the Indian Health Service (IHS), provides health care to Native Americans and produces annual information on the health status of the people it serves. IHS population statistics are based on U.S. Bureau of the Census data and include American Indians, Eskimos, and Alaska Natives residing in or near reservations (U.S. DHHS, 1993). Mortality rates, by age and gender, resulting from alcoholism and drug-related incidents were collected for the IHS population and are presented in Tables 8-12 and 8-13. It should be noted that mortality rates cited in this section are indirect estimates of exposure. Mortality (as compared to incidence or prevalence) is influenced by other factors, such as general health and nutrition and access to medical care.

Table 8-12 indicates that mortality rates from alcohol consumption are much higher for Native Americans and Alaska Natives than for all other races in the United States for all age groups and both genders. Table 8-13 presents data on drug-related deaths and indicates that the rates are higher for Native Americans than for other races at ages 15 to 24 years. At ages 25 to 34 years, the rate of drug-related deaths for Native Americans is higher than the rate for whites. At ages 45 to 54 and 55 to 64 years, drug-related death rates are higher for Native Americans than for all other races in both genders, and at ages 65 to 74 and 75 to 84 years, the rate is lower for Native Americans than for all other races in both genders.

#### **8.4. CULTURAL USE OF MERCURY**

Another example of behavioral or cultural practices that could increase a population's exposure to toxic environmental contaminants is the cultural use of mercury for religious, medical, or cosmetic purposes (TDH, 1993). The Center for Disease Control and Prevention's Agency for Toxic Substance and Disease Registry (ATSDR) published a National Alert warning of the "continued pattern of metallic mercury exposure in persons using certain folk medicines or participating in certain ethnic or religious practices" (ATSDR, 1997). Mercury exposures may be potentially greater for populations of Caribbean and Hispanic/Latino descent, who use mercury for religious and/or medicinal purposes as well as in cosmetics (CDC, 1996). Sales persons working in botanicas stores that specialize primarily in selling religious items and herbs used for preparing folk medicines and also for promoting good health estimated that Puerto Ricans,

Dominicans, and 'other Hispanics' make up about 90% of mercury buyers and that more than two-thirds of buyers are women (Zayas and Ozuah, 1996).

These practices may present opportunities for increased exposures to a percentage of the adult Caribbean and Hispanic populations (Hispanic Health Council, 1993). Children may be subject to greater exposures from the practice of sprinkling mercury on the floor near children's beds to bring good luck, which could result in increased exposures to children who crawl and play on the floor (U.S. EPA, 1993).

Zayas and Ozuah (1996) identified 41 botanicas in Hispanic neighborhoods in Bronx, New York, and in 1995, researchers surveyed botanica workers on the cost, sale, uses, and purchasers of mercury.

From the Zayas and Ozuah (1996) report, Wendroff (1996) estimates that the 35 New York botanicas sell a total of 157 mercury capsules per day. Wendroff (1996) estimated that "annual sales totaling 47,000 [capsules] could result in 13,800 individual dwellings each having a dose of some 9 grams of mercury (the mean weight of a mercury capsule) sprinkled on their respective floors in the course of one year."

## 8.5. REFERENCES

Agency for Toxic Substance and Disease Registry (ATSDR). (1997) National alert: A warning about continuing patterns of metallic mercury exposure. Atlanta, GA: U.S. Department of Health and Human Services, Center for Disease Control and Prevention, Agency for Toxic Substance and Disease Registry. ATSDR Internet address: <http://atsdr1.atsdr.cdc.gov:8080/alerts/970626.html> (Feb. 17, 1998).

Behrman, LE; Vaughan, VC, III. (1983) Textbook of pediatrics. Philadelphia: W.B. Saunders Company.

Bruhn, CM; Pangborn, RM. (1971) Reported incidence of pica among migrant families. J Am Dietit Assoc 58:417-420.

Center for Disease Control and Prevention (CDC). (1996) Mercury poisoning associated with beauty cream. May 17, 1996. Morbidity and Mortality Weekly Reports. U.S. Public Health Service, U.S. Department of Health and Human Services, Center for Disease Control and Prevention.

Danford, DC. (1982) Pica and nutrition. Ann Rev Nutr. 2:303-322.

Escobedo, LG; Anda, RF; Smith, PF; Remington, PL; Mast, EE. (1990) Sociodemographic characteristics of cigarette smoking initiation in the United States - implications for smoking prevention policy. JAMA 264(12):1550-1555.

Forfar, JO; Arneil, GC, eds. (1984) Textbook of pediatrics. 3rd ed. London: Churchill Livingstone.

Hahn, PL; Folsom, AR; Sprafka, JM; Norsted, SW. (1990) Cigarette smoking and cessation behaviors among urban blacks and whites. Public Health Rep 105(3):290-295.

Hispanic Health Council. (1993) Metallic mercury (azogue) and your health. Environmental Health Unit information booklet no. 1. Environmental Health Unit, Hispanic Health Council, Hartford, CT.

Illingworth, RS. (1983) The normal child. New York: Churchill Livingstone.

Kann, L; Warren, W; Collins, JL; Ross, J; Collins, B; Kolbe, LJ. (1993) Results from the national school-based 1991 Youth Risk Behavior Survey and progress toward achieving related health objectives for the nation. Publ Health Rep 108 (suppl.1):47-55.

Kaplan, HI; Sadock, BJ. (1985) Comprehensive textbook of psychiatry/IV. Baltimore: Williams and Wilkins.

Lourie, RS; Layman, EM; Millican, FK. (1963) Why children eat things that are not food. *Children* 10:143-146.

Robinson, JP; Thomas, J. (1991) Time spent in activities, locations, and microenvironments: a California-national comparison. Prepared by Environmental Monitoring systems Laboratory, Las Vegas, NV, for the Exposure Assessment Research Division,, U.S. Environmental Protection Agency, Washington, DC, under EPA contract no. 68-01-7325.

Sayetta, R.B. (1986) Pica: an overview. *American Family Physician*. 33(5):181-185.

TDH. (1993) Mercury Poisoning Associated with Beauty Cream: Texas, New Mexico, and California, 1995-1996. The Texas Department of Health, New Mexico Department of Health (NMDH), and San Diego County Health Department (SDCHD). 1996

Tsang, AM; Klepeis, NE. (1996) Results tables from a detailed analysis of the National Human Activity Pattern survey (NHAPS) response. Prepared by Lockheed Martin for the U.S. Environmental Protection Agency, Washington, DC, under contract no. 8-W6-001, delivery order no. 13. Draft report.

U.S. Bureau of the Census. (1995) Statistical abstract of the United States: 115th ed. U.S. Department of Commerce, Bureau of the Census, Washington, DC.

U.S. Department of Health and Human Services. (1993) Trends in Indian health. U.S. Department of Health and Human Services, Indian Health Service, Washington, DC.

U.S. Environmental Protection Agency. (1996) Exposure factors handbook. SAB Review Draft. August, 1996. Washington, DC: National Center for Environmental Assessment, Office of Research and Development. EPA/600/P-95/002Bc.

U.S. Environmental Protection Agency. (1993) RM2 assessment document for cultural uses of mercury. Office of Prevention, Pesticides and Toxic Substances, Washington, DC.

Vermeer, DE; Frate, DA. (1979) Geophagia in rural Mississippi: environmental and cultural contexts and nutritional implications. *Am J Clin Nutr* 32:2129-2135.

Wendroff, AP. (1996) June 11, 1996, letter to Amina Wilkins, U.S. Environmental Protection Agency, from A.P. Wendroff, Mercury Poisoning Project, 544 Eighth St., Brooklyn, NY 11215.

Zayas, L; Ozuah, P. (1996) Letter to the editor. *Am J Public Health*. 86(1):111.

Table 8-1. Percentage of Respondents Participating in Various Activities and Spending Time in Various Locations and Microenvironments During the 24-hour Day Included in the Diary

		Percentage of Survey Respondents Participating in Activities or Time in Various Places the Day the Diary Was Compiled		
Code Description		California <sup>a</sup> n= 1,762 (%)	National <sup>b</sup> n= 5,358 (%)	Relevance to Exposure <sup>c</sup>
<b>Activity</b>				
0	Travel	91	91	potential exposure to carbon monoxide and benzene
1	Sleep	100	100	potential exposure to carbon monoxide and benzene
2	Household work - family and personal care	95	100	potential exposure to carbon monoxide and benzene
3	Cook	49	61	potential exposure to smoke and gas from cooking
4	Eat	95	98	potential exposure to smoke and gas from cooking
5	Shopping/errands	49	49	potential exposure to smoke and gas from cooking
6	Work/study residences	49	52	potential exposure to smoke and gas from cooking
7	Leisure/communication - indoors (TV-resting-reading)	92	94	potential exposure to smoke and gas from cooking
8	Physical activities	24	23	highly elevated breathing rate
9	Cultural/social	54	71	highly elevated breathing rate
<b>Locations</b>				
0	Autoplaces (garage, auto repair...)	19	5	potential exposure to carbon monoxide and volatile organic compounds
1	Indoor residence/kitchen	77	87	potential exposure to smoke and gas
2	Indoor residence/other rooms	99	99	potential exposure to smoke and gas
3	Indoor offices and factories	40	47	potential exposure to various pollutants based on job
4	Indoor restaurant/bar	35	28	potential exposure to various pollutants based on job
5	Indoor other locations (not residence)	72	78	potential exposure to ambient pollutants
6	Outdoor/yard, outside of residence	30	41	potential exposure to ambient pollutants
7	Outdoor/other, parks	47	19	potential exposure to ambient pollutants
8	In locations with internal combustion	86	90	potential exposure to carbon monoxide and benzene
9	Other vehicles	4	1	potential exposure to carbon monoxide and benzene
<b>Microenvironments<sup>a</sup></b>				
1	Auto places	19	5	
2	Restaurant/bar	35	28	
3	In vehicles with internal combustion	86	90	
4	In other vehicles	4	1	
5	Physical activity/outdoor	16	13	
6	Physical activity/indoor	10	11	
7	Work/study-residence	10	11	
8	Work/study-other places	41	46	
9	Cooking	49	61	
10	Other activities/kitchen	67	83	

Table 8-1. Percentage of Respondents Participating in Various Activities and Spending Time in Various Locations and Microenvironments During the 24-hour Day Included in the Diary (continued)

Code Description	Percentage of Survey Respondents Participating in Activities or Time in Various Places the Day the Diary Was Compiled		Relevance to Exposure <sup>c</sup>
	California <sup>a</sup> n= 1,762 (%)	National <sup>b</sup> n= 5,358 (%)	
11 Chores/child care	92	99	
12 Shopping/errands	45	46	
13 Other/outdoor	59	47	
14 Social/cultural	47	62	
15 Leisure-eat/indoor	95	97	
16 Sleep/indoor	99	100	

<sup>a</sup> California Air Resources Board, 1987-88 study.

<sup>b</sup> Americans' Use of Time, 1985 national study.

<sup>c</sup> For exposure relevance, see activity and locations section.

Source: Robinson and Thomas, 1991.

Table 8-2. Incidence of Pica Reported by Wives of Migrant Workers of Mexican and “Anglo” Heritage

Group Exhibiting Pica	Observation of Pica		Number Observing Pica in Own or in Relative's Families
Mexican Families			
Children	21	32	12
Pregnant Women	25	38	13
Nonpregnant Women	10	15	1
"Anglo" Families			
Children	14	54	11
Pregnant Women	5	19	3
Nonpregnant Women	2	7	1

Source: Bruhn and Pangborn, 1971.

Table 8-3. Incidence of Geophagia Practice by Surveyed Population in Holmes Co., Mississippi<sup>a</sup>

Population	Total Number of Survey Population	Number of Geophagia Practitioners	Geophagia Practitioners Percentage
Women	56	32	57
Men	33	0	0
Children	115	18	16
Adolescents	25	0	0
Pregnant and Postpartum Women	142	40	28

<sup>a</sup> Data source: Nutrition and Perinatal Survey, Health Research Project.

Source: Vermeer and Frate, 1979.



Table 8-4. Percentage of 1991 Youth Risk Behavior Survey Respondents Reporting High Health Risk Behavior by Ethnic Group<sup>a</sup>

Behavior <sup>b</sup>	Ethnic Group			
	White	Black	Hispanic	Total
Physical fighting <sup>c</sup>	41.0 ± 2.6	50.6 ± 4.5	41.3 ± 4.8	42.5 ± 2.3
Weapon carrying <sup>d</sup>	25.1 ± 2.6	32.7 ± 3.1	25.8 ± 4.6	26.1 ± 2.1
Thought seriously about suicide	29.9 ± 1.9	22.2 ± 2.0	26.8 ± 3.7	29.0 ± 1.6
Made suicide plans	19.0 ± 1.8	14.8 ± 2.4	15.9 ± 2.5	18.6 ± 1.6
Attempted suicide	6.7 ± 1.2	6.6 ± 2.0	7.9 ± 1.8	7.3 ± 0.3
Suicide attempt required medical attention	1.6 ± 0.5	1.8 ± 0.8	1.7 ± 0.5	1.7 ± 0.3
Frequent cigarette use <sup>e</sup>	15.4 ± 2.5	3.1 ± 1.1	6.8 ± 1.6	12.7 ± 2.2
Smokeless tobacco use <sup>f</sup>	13.0 ± 2.1	2.1 ± 0.5	5.5 ± 2.8	10.5 ± 1.7
Current alcohol use <sup>g</sup>	52.9 ± 3.5	42.0 ± 4.8	54.3 ± 5.4	50.8 ± 3.4
Episodic heavy alcohol use <sup>h</sup>	34.9 ± 3.2	16.8 ± 3.8	32.2 ± 5.8	31.3 ± 3.3
Current marijuana use <sup>i</sup>	15.2 ± 2.8	13.5 ± 3.3	14.4 ± 4.8	14.7 ± 2.2
Current cocaine use <sup>j</sup>	1.7 ± 0.6	0.6 ± 0.3	3.1 ± 1.7	1.7 ± 0.5
Have had four or more sex partners	14.7 ± 1.7	43.1 ± 3.5	16.8 ± 3.3	18.7 ± 1.9
Currently sexually active <sup>j</sup>	67.9 ± 2.3	72.9 ± 3.1	69.6 ± 3.8	69.3 ± 2.1

<sup>a</sup> All percentages are reported with the 95% confidence interval.

<sup>b</sup> High health risk behavior exhibited within the 12 months preceding the survey.

<sup>c</sup> Participated in at least one fight.

<sup>d</sup> Carried gun, knife, or club at least 1 day during the 30 days preceding the survey.

<sup>e</sup> Frequent user, smoking cigarettes on 20 or more of the 30 days preceding the survey.

<sup>f</sup> Used chewing tobacco or snuff on 1 or more of the 30 days preceding the survey.

<sup>g</sup> Consumed at least one drink of alcohol during the 30 days preceding the survey.

<sup>h</sup> Consumed five or more drinks of alcohol during the 30 days preceding the survey.

<sup>i</sup> Used during the 30 days preceding the survey.

<sup>j</sup> Has had intercourse during the 3 months preceding the survey.

Source: Kann et al., 1993.

Table 8-5. Percentage of 1991 Youth Risk Behavior Survey Respondents Reporting High Health Risk Dietary Behavior and Physical Activity by Sex, Grade, and Ethnic Group<sup>a</sup>

		Dietary Behavior and Physical Activity		
Category		Ate 5 or more servings of fruits and vegetables <sup>b</sup>	Ate no more than 2 servings of foods typically high in fat content <sup>b</sup>	Engaged in moderate physical activity <sup>c</sup>
Sex	Female	10.5 ± 1.4 <sup>c</sup>	72.9 ± 1.6	41.2 ± 4.2
	Male	15.2 ± 1.6	57.2 ± 3.3	40.7 ± 3.3
Grade	9	14.7 ± 3.3	63.5 ± 2.4	49.3 ± 3.2
	10	14.0 ± 1.8	62.1 ± 4.3	42.9 ± 4.8
	11	12.2 ± 1.4	66.0 ± 2.5	39.4 ± 3.3
	12	10.3 ± 1.6	68.1 ± 2.7	32.4 ± 3.8
Race or Ethnicity	White	13.9 ± 1.4	64.4 ± 2.7	37.6 ± 4.2
	Black	6.8 ± 1.4	61.3 ± 3.5	49.4 ± 5.7
	Hispanic	9.7 ± 2.0	72.0 ± 2.4	49.6 ± 8.1
Total		12.9 ± 1.2	64.9 ± 2.2	40.9 ± 3.5

<sup>a</sup> All percentages are reported with 95% confidence intervals.

<sup>b</sup> Consumed during the day preceding the survey.

<sup>c</sup> Included walking or bicycling for at least 30 minutes during the day preceding the survey.

Source: Kann et al., 1993.

Table 8-6. Age-Adjusted Prevalence of Cigarette Smoking Among Black and White Men and Women Aged 35 to 74 Years by Percents (Minnesota Heart Survey)

Smoker Characteristic	Never Smoked	Former Smoker	Current Smoker	Ratio <sup>a</sup>
Men <sup>b</sup>				
Black	26	30	43	41
White	30	44	25	64
Black-White difference	-4	-14	18	-23
95% CL	-9, 1	-20, -8	13, 23	-30, -16
Women <sup>d</sup>				
Black	49	18	33	35
White	46	29	24	54
Black-White difference	3	-11	9	-19
95% CL	-2, 8	-16, -6	4, 14	-26, -12

<sup>a</sup> Ratio of former smokers to those who ever smoked (value out of 100%)

<sup>b</sup> N = 459 Black; N = 76 White

<sup>c</sup> CL = confidence limits

<sup>d</sup> N = 593 Black; N = 811 White

NOTE: All values out of 100 percent.

Source: Hahn et al., 1990.

Table 8-7. Age- and Education-Specific Prevalence of Current Cigarette Smoking Among Black and White Men and Women (Minnesota Heart Survey)

Characteristic	Population							
	High School or Less				More Than High School			
	Men		Women		Men		Women	
	35-54 years	55-74 years	35-54 years	55-74 years	35-54 years	55-74 years	35-54 years	55-74 years
Black								
Percent	51	43	41	29	41	32	32	24
Number	138	105	184	154	147	69	176	68
White								
Percent	35	26	27	33	23	23	23	12
Number	138	119	205	166	371	135	332	108
Black-White Difference								
Percent	16	17	14	-4	18	9	9	12
95 Percent CL	4, 28	5, 29	5, 23	-14, 6	9, 27	-4, 22	1, 17	1, 23

Note: CL = confidence limits.

Source: Hahn et al., 1990.

Table 8-8. Current Smokers' Smoking Cessation Behaviors in Percents (Minnesota Heart Survey)

	Behavior									
	Changes Attempted in Last Year					Changes Anticipated in Next Year				
	Tried to reduce no. of cigarettes	Tried brand with lower tar or nicotine	Tried to quit	Tried to quit and able to stay off cigarettes a week or more	Quit completely	Try to quit	Reduce no. of cigarettes per day	Switch to brand with lower tar or nicotine	No change anticipated	Other
Men <sup>a</sup>										
Black	70	29	52	25	36	14	17	2	32	0
White	76	33	63	30	47	21	8	0	24	0
Women <sup>b</sup>										
Black	73	37	56	27	35	29	17	2	26	1
White	80	37	58	22	38	17	18	0	27	1

<sup>a</sup> N = 197 Black, N = 195 White

<sup>b</sup> N - 195 Black, N - 199 White

Note: Percents may not add to 100 because of rounding.

Source: Hahn et al., 1990.

Table 8-9. Rates of Smoking Initiation by Sex, Age at Smoking Onset, and Race/Ethnicity

Race/Ethnicity	Initiation Rate (%) <sup>a</sup>				Total
	Males		Females		
	≤18 Years	19-35 Years	≤18 Years	19-35 Years	
White	39	15	38	14	47
Black	30 <sup>b</sup>	22 <sup>b</sup>	24 <sup>c</sup>	15	40 <sup>d</sup>
Mexican American	47 <sup>b</sup>	19	21 <sup>c</sup>	14	45
Cuban American	43	17	28 <sup>c</sup>	15	45
Puerto Rican American	48 <sup>b</sup>	12	38 <sup>c</sup>	17	51

<sup>a</sup> Initiation rate is defined as the percentage of persons who started to smoke in an age interval among persons who never smoked in that age interval.

<sup>b</sup> Initiation rate is significantly different from that among whites of the same sex and age interval.

<sup>c</sup> Initiation rate among women is significantly less than that among men of the same race/ethnicity and age interval.

<sup>d</sup> Initiation rate is significantly less than that among whites.

Source: Escobedo et al., 1990.

Table 8-10. Rates of Smoking Initiation by Age at Smoking Onset, Race/Ethnicity, and Educational Attainment

Race/Ethnicity and Age at Smoking Onset	Initiation Rate, % <sup>a</sup>		Rate Ratio (95% Confidence Interval) <sup>b</sup>
	≥High School Education	< High School Education	
White			
≤11 years	1.4	6.6	4.9 (3.5, 6.8)
12-18 years	33.4	64.6	1.9 (1.8, 2.0)
19-35 years	14.4	15.9	1.1 (0.9, 1.4)
Black			
≤11 years	0.7	2.5	3.5 (1.5, 8.3)
12-18 years	22.3	41.1	1.8 (1.6, 2.2)
19-35 years	18.6	15.2	0.8 (0.6, 1.2)
Hispanic			
≤11 years	2.0	2.5	1.3 (0.7, 2.2)
12-18 years	28.3	40.6	1.4 (1.2, 1.7)
19-35 years	14.0	19.3	1.4 (1.1, 1.7)

<sup>a</sup> Initiation rate is defined as the percentage of persons who started to smoke in an age interval among persons who never smoked in that age interval.

<sup>b</sup> Rate ratio is the initiation rate among persons with less than a high school education divided by the initiation rate among persons with a high school education or more.

Source: Escobedo et al., 1990.

Table 8-11. Use of Selected Drugs by Age of User: 1993  
[Percent of Total Population]

Substance and Age Group	Total <sup>a</sup>	Sex		Race/Ethnicity			Region			
		Male	Female	White <sup>b</sup>	Black <sup>b</sup>	Hispanic	Northeast	Midwest	South	West
CURRENT USERS										
Cigarettes: Total	24.2	26.2	22.3	24.7	23.4	21.2	25.4	24.3	24.3	22.7
12-17 years	9.6	9.3	10.0	11.0	4.0	8.4	10.5	11.1	8.4	9.0
18-25 years	29.0	30.9	27.2	32.7	16.3	25.5	32.9	26.9	29.7	26.7
26-34 years	30.1	31.4	28.8	31.1	30.5	24.8	30.6	30.7	31.8	26.2
35 years and older	23.8	26.7	21.3	23.4	28.0	21.5	24.5	24.5	23.3	22.9
Alcohol: Total	49.6	57.4	42.5	52.7	37.6	45.6	54.1	48.6	44.9	54.2
12-17 years	18.0	18.3	17.7	19.2	13.1	17.5	20.4	19.5	15.4	18.1
18-25 years	59.3	64.5	54.3	65.3	45.0	49.9	61.0	61.2	55.6	62.4
26-34 years	62.8	70.1	55.7	66.3	54.5	56.0	65.0	64.7	58.9	64.6
35 years and older	48.8	59.1	39.9	51.5	35.5	47.1	54.7	47.0	42.8	55.1
Marijuana: Total	4.3	6.0	2.8	4.2	5.6	4.7	4.2	3.5	4.3	5.5
12-17 years	4.9	5.5	4.3	4.5	5.8	6.7	5.0	5.0	3.7	6.7
18-25 years	11.1	16.5	5.7	12.5	9.2	7.8	10.2	10.2	11.2	10.9
26-34 years	6.7	9.0	4.5	6.8	9.9	4.1	5.2	5.2	6.1	8.7
35 years and older	1.9	2.5	1.4	1.7	2.7	2.9	1.5	1.5	2.1	2.7
Cocaine: Total	0.6	0.9	0.4	0.5	1.3	1.1	0.7	0.5	0.6	0.8
12-17 years	0.4	0.4	0.4	0.3	0.3	1.0	0.2	0.3	0.4	0.6
18-25 years	1.5	1.7	1.4	1.6	1.3	2.1	1.9	0.5	1.5	2.3
26-34 years	1.0	1.6	0.4	0.9	1.8	1.1	1.3	0.8	0.9	1.0
35 years and older	0.4	0.6	0.2	0.2	1.4	0.7	0.3	0.5	0.3	0.4
Smokeless tobacco: Total	2.9	5.9	0.2	3.5	1.5	1.1	2.2	3.0	3.9	2.0
12-17 years	2.0	3.9	-. <sup>c</sup>	2.7	0.2	0.9	0.9	2.2	2.9	1.1
18-25 years	6.4	12.7	0.2	8.5	1.1	1.9	4.2	6.9	7.7	5.5
26-34 years	4.4	8.9	0.1	5.9	0.2	1.0	1.6	4.2	6.6	3.8
35 years and older	1.9	3.7	0.3	1.9	2.5	0.8	2.3	2.0	2.2	0.6
EVER USED										
Crack: Total	1.8	2.6	1.1	1.6	3.4	2.0	1.7	1.2	1.7	3.0
12-17 years	0.4	0.2	0.5	0.2	0.3	1.2	0.2	0.1	0.4	0.7
18-25 years	3.5	4.6	2.5	4.0	2.1	3.5	3.3	2.4	3.5	4.9
26-34 years	4.2	5.9	2.5	3.8	7.2	3.2	3.5	3.0	4.4	5.7
35 years and older	0.9	1.5	0.4	0.7	3.3	1.1	1.1	0.6	0.5	1.9
Inhalants: Total	5.3	7.4	3.3	5.8	2.9	4.9	4.3	5.1	4.7	7.3
12-17 years	5.9	5.5	6.3	6.5	1.7	7.7	5.7	4.7	4.6	9.7
18-25 years	9.9	12.4	7.4	12.4	2.0	7.2	10.4	11.5	8.3	10.4
26-34 years	9.4	12.9	6.1	11.5	4.0	5.0	7.7	8.9	10.1	10.5
35 years and older	2.8	4.7	1.1	2.8	3.1	3.0	1.9	2.9	2.1	4.8
Hallucinogens: Total	8.7	11.8	5.9	10.1	3.0	5.9	7.6	7.5	7.6	13.2
12-17 years	2.9	3.4	2.4	3.1	0.2	4.1	2.0	2.0	2.6	5.5
18-25 years	12.5	15.2	9.9	15.8	1.9	7.8	10.6	12.5	11.2	16.4
26-34 years	15.9	19.7	12.2	19.6	5.3	6.7	13.7	14.1	15.1	10.8
35 years and older	6.6	10.0	3.7	7.3	3.1	5.1	6.1	5.8	5.1	11.01
Stimulants: Total <sup>d</sup>	6.0	7.4	4.8	6.9	3.0	3.9	6.2	4.4	5.2	9.3
12-17 years	2.1	2.0	2.2	2.5	0.2	2.2	0.9	2.1	2.0	3.1
18-25 years	6.4	7.2	5.7	8.0	1.3	4.4	4.9	5.3	4.6	11.8
26-34 years	10.5	12.1	8.9	12.7	3.2	5.8	7.8	9.7	9.0	16.1
35 years and older	5.3	7.0	3.8	5.7	4.2	3.3	6.8	3.1	4.8	7.4
Sedatives: Total <sup>d</sup>	3.4	4.1	2.8	3.6	2.2	2.2	2.8	2.0	3.3	6.1
12-17 years	1.4	1.2	1.6	1.4	0.9	2.2	1.2	0.6	1.5	2.4
18-25 years	2.7	3.4	2.0	3.1	1.5	2.4	2.2	1.4	2.8	4.3
26-34 years	4.8	5.5	4.0	5.9	1.8	2.2	3.7	4.2	5.0	5.9
35 years and older	3.6	4.4	4.4	3.5	2.9	2.1	3.0	1.8	3.1	7.2

(continued)



Table 8-11. Use of Selected Drugs, by Age of User: 1993 (continued)  
[Percent of Total Population]

Substance and Age Group	Total <sup>a</sup>	Sex		Race/Ethnicity			Region			
		Male	Female	White <sup>b</sup>	Black <sup>b</sup>	Hispanic	Northeast	Midwest	South	West
Tranquilizers: Total <sup>d</sup>	4.6	5.0	4.1	5.2	2.3	2.8	3.7	4.3	4.2	6.3
12-17 years	1.2	1.0	1.4	1.4	0.4	1.1	1.0	0.4	1.6	1.9
18-25 years	5.4	45.8	4.9	7.0	1.2	2.4	4.0	4.3	6.2	6.2
26-34 years	7.1	8.0	6.2	8.4	3.0	3.6	5.3	6.9	7.1	8.9
35 years and older	4.2	4.6	3.8	4.5	2.9	3.0	3.6	4.4	3.2	6.3
Analgesics: Total <sup>d</sup>	5.8	6.7	4.9	6.3	3.5	3.9	5.3	4.3	5.3	8.8
12-17 years	3.7	2.8	4.5	4.1	2.7	3.2	3.7	3.0	3.3	5.1
18-25 years	8.7	9.3	8.1	10.6	4.6	4.4	7.6	7.8	7.4	12.5
26-34 years	9.0	11.1	7.0	10.3	3.4	5.9	7.0	7.4	8.0	14.0
35 years and older	4.4	5.4	3.6	4.6	3.5	2.8	4.5	3.0	4.2	6.7

<sup>a</sup> Includes other races, not shown separately.

<sup>b</sup> Non-Hispanic.

<sup>c</sup> Low precision; no estimate reported.

<sup>d</sup> Nonmedical use; does not include over-the-counter drugs.

Source: Bureau of the Census, 1995.

Table 8-12. Alcoholism Mortality Rates for American Indians and Alaska Natives by Age and Sex<sup>a</sup>

Age Group	Both Sexes	Male	Female
Under 5 years	--	--	--
5-14 years	--	--	--
15-24 years	4.8	6.5	3.1
25-34 years	27.6	34.3	21.2
35-44 years	6.15	84.9	39.7
45-54 years	95.6	125.7	68.0
55-64 years	97.3	126.9	71.7
65-74 years	76.4	123.9	38.8
75-84 years	34.4	64.0	14.4
85 years+	24.5	33.4	19.4
<b>U.S. ALL RACES</b>			
Under 5 years	0.0	0.0	0.0
5-14 years	0.0	0.0	--
15-24 years	0.3	0.5	0.1
25-34 years	2.7	3.9	1.6
35-44 years	10.1	15.6	4.7
45-54 years	18.3	28.4	8.7
55-64 years	23.7	37.9	11.2
65-74 years	19.3	33.4	8.4
75-84 years	10.8	21.5	4.4
85 years+	3.8	10.2	1.3
<b>U.S. WHITE</b>			
Under 5 years	0.0	--	0.0
5-14 years	0.0	0.0	--
15-24 years	0.3	0.5	0.1
25-34 years	2.0	3.0	1.1
35-44 years	7.5	11.8	3.3
45-54 years	14.7	22.9	6.8
55-64 years	21.4	34.1	10.0
65-74 years	18.2	31.7	7.9
75-84 years	10.1	20.3	4.2
85 years+	3.6	9.8	1.1

<sup>a</sup> American Indians and Alaska natives, IHS service area, 1987-1989, and U.S. all races and white populations, 1988 (rate per 100,000 population).

Note: "--" Represents zero. 0.0 rounds to zero.

Source: U.S. DHHS, 1993.

Table 8-13. Drug-Related Mortality Rates for American Indians and Alaska Natives by Age and Sex<sup>a</sup>

Age Group	Both Sexes	Male	Female
Under 5 years	2.2	2.2	2.2
5-14 years	0.1	-	0.3
15-24 years	4.8	4.9	4.7
25-34 years	7.2	8.6	5.8
35-44 years	6.1	5.8	6.3
45-54 years	4.9	3.9	5.7
55-64 years	5.4	3.5	7.1
65-74 years	2.5	1.9	3.0
75-84 years	1.7	-	2.9
85 years+	-	-	-
<b>U.S. ALL RACES</b>			
Under 5 years	0.2	0.2	0.1
5-14 years	0.1	0.1	0.1
15-24 years	2.4	2.7	2.1
25-34 years	7.7	11.0	4.4
35-44 years	8.0	11.3	4.8
45-54 years	8.0	4.9	3.9
55-64 years	3.3	3.3	3.3
65-74 years	2.8	2.6	2.9
75-84 years	4.1	4.3	3.9
85 years+	6.0	6.6	5.8
<b>U.S. WHITE</b>			
Under 5 years	0.1	0.1	0.1
5-14 years	0.1	0.1	0.1
15-24 years	2.3	2.8	1.8
25-34 years	6.9	9.9	3.9
35-44 years	6.5	8.9	4.1
45-54 years	4.0	4.0	4.1
55-64 years	3.2	2.9	3.4
65-74 years	2.8	2.5	3.0
75-84 years	4.2	4.4	4.1
85 years+	6.0	6.8	5.7

<sup>a</sup> American Indians and Alaska natives, IHS service area, 1987-1989, and U.S. all races and white populations, 1988 (rate per 100,000 population).

Note: "-" Represents zero. 0.0 rounds to zero.

Source: U.S. DHHS, 1993.